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Characteristics of Eye Tumor in Children Diagnosed at the National Eye Center Cicendo Eye Hospital

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Abstract

Background: Eye tumors are commonly found and fatal among pediatric patients. The immediacy of management depends on the diagnosis, and is increased when the patient's characteristics are known. This study aimed to describe the characteristics of pediatric patients diagnosed with eye tumors.

Methods: This was a descriptive retrospective study using secondary data involving 102 medical records of pediatric patients diagnosed with eye tumors at the National Eye Center Cicendo Eye Hospital Bandung in the period of January 2013 to December 2014.

Results: The characteristics of 102 subjects: 54 (52.9%) were female, 59 (57.8%) were 1 to 4 years old, and 79 (77.5%) were from West Java. The characteristics of the tumors: 42 (41.2%) presented with a chief complaint of leukocoria, 73 (71.6%) were malignant, 68 (66.7%) were retinal, and the most common managements were surgery (64.7%). The most common malignant tumors were retinoblastoma (93.2%) while the most common benign tumors were dermoid cyst (31%).

Conclusions: Patients are frequently 1–4 years old and the most common diagnosis was retinoblastoma for malignant tumor and dermoid cyst for benign tumor. **[AMJ.2017;4(1):6–10]**

Keywords: Characteristics, children, eye tumors

Introduction

Tumors that occur in children are about 2% of all tumors. Tumors cause a mortality rate of 10% among children, second only to accidents. Tumors frequently damage cognitive, growth, social, and also sexual functions of the children.[1] In the United States in 2005, there were 2,120 new eye tumor cases, comprising 1,090 males and 1,030 females, and causing 230 deaths. The average eye tumor annual incidences in the UK were 3.5/1,000,000 for children under 15 and 11.8/1,000,000 for those under 5. Based on studies conducted on children, retinoblastoma is the most commonly found eye malignancy (61.33%) while dermoid cyst is its benign counterpart (13.33%). This study aimed to describe the characteristics of pediatric patients diagnosed with eye tumors.[2–4]

The diagnosis of a tumor is confirmed by a tissue biopsy. Tumors that have been diagnosed earlier, have higher cure rates due to more immediate treatments.[5–6] Eye tumors can be treated with enucleation, radiotherapy, and chemotherapy. How fast treatments can start depends on how early the patient is diagnosed, which can be performed even quicker if the characteristics of the pediatric eye tumor patients are known.[1,6–7] This study aimed to describe the characteristics of pediatric patients diagnosed with eye tumors.

Methods

This descriptive retrospective study utilized total sampling using secondary data of the medical records of pediatric patients diagnosed with eye tumors at the National Eye Center Cicendo Eye Hospital in the period of January 1, 2013 to December 31, 2014. The inclusion criterion was pediatric patients aged

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Table 1 Demography of Pediatric Eye Tumor Patients at the National Eye Center Cicendo Eye Hospital in the period of 2013–2014

Variable	Frequency (n=102)	Percentage (%)
Gender		
Male	48	47.1
Female	54	52.9
Age (Years)		
0–1	11	10.8
1–4	59	57.8
5–14	32	31.4
Residence		
West Java	79	77.5
The Rest of Java	11	10.7
Outside Java Island	12	11.8

0–14 years old, while the exclusion criterion was those without anatomical pathology examination. This study was conducted from September to November 2015 at the National Eye Center Cicendo Eye Hospital Bandung. It had been approved by the Health Research Ethics Committee Faculty of Medicine Universitas Padjadjaran.

The collected data comprised the characteristics of the patients and the eye tumor. The collected patients' characteristics were gender, age, and residence. Meanwhile, the collected tumor characteristics were chief complaint, tumor classification, tumor diagnosis, and treatment performed.

The data were input to the Microsoft Excel software. Then, calculated and grouped based on the characteristics. The results were presented in tables. Results were then compared to the findings of previous studies.

Results

Out of 102 respondents, a tendency towards a gender type was not observed; only subjects under 15 years old were recruited, in accordance with the age limit of pediatric patients by the hospital. The age grouping was conducted according to the World Health

Table 2 Chief Complaint of Pediatric Eye Tumor Patients at the National Eye Center Cicendo Eye Hospital in the period of 2013–2014

Variable	Frequency (n=102)	Percentage (%)
Mass	27	26.5
Strabismus	1	1.0
Leukocoria	42	41.2
Eyeball enlargement	20	19.6
Ocular pain	1	1.0
Membrane covering the eye	8	7.9
Blurred vision	1	1.0
Red Eyes	1	1.0
Bleeding	1	1.0

Table 3 Tumor Classification of Pediatric Eye Tumor Patients at the National Eye Center Cicendo Eye Hospital in the period of 2013–2014

Variable	Frequency (n=102)	Percentage (%)
Tumor Type		
Malignant	73	71.6
Benign	29	28.4
Tumor Location		
Palpebra	14	13.7
Conjunctiva	15	14.7
Orbit	5	4.9
Retina	68	66.7

Table 4 Malignant Tumor Diagnosis of Pediatric Eye Tumor Patients at the National Eye Center Cicendo Eye Hospital in the period of 2013–2014

Tumor Name	Frequency (n=73)	Percentage (%)
Melanoma	2	2.8
Retinoblastoma	68	93.2
Rhabdomyosarcoma	2	2.7
Squamous Cell Carcinoma	1	1.4

Organization (WHO) age classification for general purpose.[8] The age group with the most members was the 1–4 group (57.8%). The patients' residence had a high variation, yet the majority of the patients came from West Java (77.5%) (Table 1).

The largest group of patients came due to leukocoria (41.2%). The second and third largest groups had chief complaints of ocular mass (26.5%) and eye enlargement (19.6%) respectively (Table 2).

The type of tumor was either malignant or benign, which could be determined by physical examination, laboratory examination, and primarily anatomical pathology examination. There were more malignant tumors (71.6%)

Table 5 Benign Tumor Diagnosis of Pediatric Eye Tumor Patients at the National Eye Center Cicendo Eye Hospital in the period of 2013–2014

Tumor Name	Frequency (n=29)	Percentage (%)
Granuloma	1	3.4
Capillary Hemangioma	4	13.8
Dermoid Cyst	9	31.0
Epidermoid Cyst	3	10.3
Lipodermoid	4	13.8
Nevus	6	20.7
Papilloma	1	3.4
Schwannoma	1	3.4

Table 6 Treatment of Pediatric Eye Tumor Patients at the National Eye Center Cicendo Eye Hospital in the period from 2013–2014

Treatment	Frequency (n=102)	Percentage (%)
Surgery	66	64.7
Surgery and chemotherapy	29	28.4
Chemotherapy	4	3.9
Observation	3	2.9
Radiotherapy	0	0.0

found and the most tumors were located in the retina (66.7%) (Table 3).

Retinoblastoma (93.2%) was the most common malignant tumor and Squamous Cell Carcinoma was the least common malignant tumor found in pediatric eye tumor patients (Table 4).

The diagnosis of benign tumor was more spread out than malignant tumor. The two most common types of benign tumor found were dermoid cyst (31.0%) and nevus (20.7%) (Table 5).

The treatments prescribed for eye tumors are usually surgery, chemotherapy, and/or radiotherapy. Nevertheless, in this study, many patients virtually underwent surgery (64.7%), and some also went for surgery with chemotherapy (28.4%) (Table 6).

Discussion

Studies on pediatric eye tumor are frequently conducted in several countries. In Taiwan[6] and China[9], eye tumors are more commonly found among males. This is due to their culture, in which boys are prioritized over girls by their families. As such, more boys receive medical attention and the mortality rates are lower among them.[6,9] Referring to the studies mentioned, cultural characteristics of a country can possibly contribute to the results of a study. In Indonesia, a tendency towards a gender has not been found, hence, the similar number of male and female patients was found in this study. Similar finding was also found in the United States.[2,10]

The majority of the patients were in the 1–4 age group. This finding is in accordance with studies conducted in the US and China which stated that tumor cases have the highest incidence in developing countries, especially among children under 4. However, several studies mentioned the highest incidence occurs in children under 8.[3,6,9,11–13] Genetic changes and viral infections in early stages of life will cause clinical symptoms to be visible in this age group.[14]

In this study, the most prevalent chief complaint was leukocoria. Congruent findings were also in China and the US.[3,9] The high frequency of this complaint was due to the high number of retinoblastoma cases, in which the eyes do appear to have a glare like a cat's eyes.[3,5,15]

Malignant tumors were more prevalent in this study, which is similar to the finding in a Korean study. However, this contrasts with the findings in Ireland and the US which revealed that benign tumors are more common.[3,5,16–17] Anatomical pathology examination affected the proportion of malignancy in this study as this examination is more frequently performed in cases where malignancy and visual capabilities are likely threatened.[6] Table 3 also showed that most of tumors were located in retina, which was attributed to the high number of retinoblastoma, as also found in the US. [3,5,15,18]

Retinoblastoma was the most commonly found malignant tumor in this study, in agreement with the findings in the US.[3,5,15,17] However, this differs from a study conducted in Korea which found rhabdomyosarcoma to be more common than retinoblastoma.[16]

The most common benign tumor in this study was dermoid cyst, followed by nevus. Similarly, dermoid cyst is also the most common type of benign orbital tumor found in American studies.[3,5]

This study discovered that almost all of the subjects underwent surgery, which some of them also had chemotherapy. Chemotherapy can be performed both before surgery to reduce the tumor size, and after surgery to prevent tumor regrowth.[6,9,19] Surgery is frequently performed to prevent tumor

growth inside the eyeball and optic nerve infiltration.[2,6,20] In this study, no subjects underwent radiotherapy. Doctors often decide to only observe when the tumor mass is still very small, seems unthreatening, and has a probability of spontaneous regression.[15]

Based on the results and the discussion above, the conclusions of this study are as follows: the subjects are balanced gender-wise, mostly in the 1–4 age group, and mostly residents of West Java. The characteristics of the tumors in this study are: the most common chief complaint is leukocoria; the most common malignant tumor is retinoblastoma; and the most common benign tumor is dermoid cyst. Based on its location, the majority of the tumors are located in the retina. Besides, the most prescribed treatment is surgery.

This study only comprised the characteristics recorded in medical record. It is suggested for the next study to take primary data so that patients' characteristics can be described thoroughly.

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